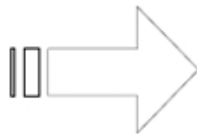


PPG12500 12.5Gb/s Programmable Pattern Generator Pattern Utility Software

Users Guide

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1. Introduction

The Centellax PPG12500 Programmable Pattern Generator (PPG) has 24Mbits of programmable pattern memory. The PPG12500 includes many telecom and datacom preloaded RAM patterns, including CRPAT, CJPAT, K28-3, K28-5, K28-7, and PRBS 2^N [$N = 7, 10, 11, 13, 15, 23$]. The Centellax Pattern Utility Software allows users to create and upload their own custom patterns onto the PPG12500 for playback.

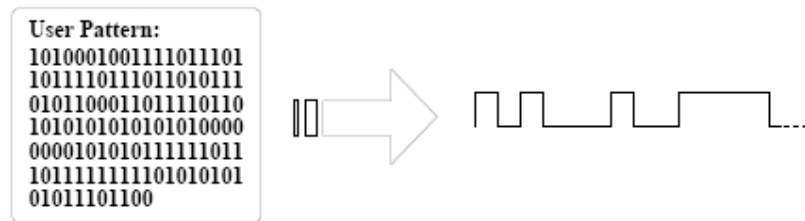


Figure 1 User pattern to high-speed data

Features:

- Create custom patterns in binary or hexadecimal format
- Check syntax of custom patterns to ensure file integrity
- Save pattern files to PC disk drive
- Upload custom patterns to a PPG12500 Programmable Pattern Generator
- Manage custom patterns on a PPG12500 Programmable Pattern Generator

2. Installation

Download the software from www.centellax.com or access the software from the CD that was shipped with the PPG12500.

Save the file to a temporary location (for example, C:/temp).

Double-click the following file from Windows Explorer:

e.g. C: /temp/setup.exe

Follow the on-screen installation instructions.

If upgrading an already installed version of the Centellax Pattern Utility Software, it is recommended to first uninstall the original version, then install the new version.

3. Creating Patterns – the Editor Window

3.1. File Format

A pattern file can be made up of either binary or hexadecimal data, but not both. In binary pattern mode, only characters in the following set are allowed in the pattern data:

- 0-1

In hexadecimal pattern mode, only characters in the following sets are allowed in the pattern data:

- 0-9
- a-f
- A-F

The pattern file extensions allowed are:

- For files in binary format = *<filename>.bpt*
- For files in hexadecimal format = *<filename>.hpt*

The most significant bit on the first line of the pattern file is the first bit generated in the serial pattern. The right most bit of the last line of the pattern file will be the final bit generated in the serial pattern.

The PPG12500 can play back custom user patterns up to 24Mbits long (25165824 bits). The length of the pattern file that is ultimately stored in PPG12500 memory must be exactly divisible by 128 and be a minimum of 256bits long. If the pattern length created in the Centellax Pattern Utility Software is not divisible by 128 and at least 256 bits long, then the pattern will be replicated until it meets these conditions. In some cases, the replicated pattern created may not fit in the available amount of PPG12500 memory. In such a case, an error message will be generated requesting that the pattern be modified to meet the pattern length requirements. Refer to Figure 2.

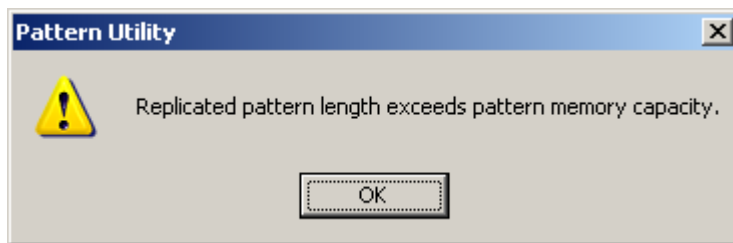


Figure 2 Error message if replicated pattern exceeds memory size

The PPG12500 Programmable Pattern Generator requires filenames to be in a DOS 8.3 format, with *.usr* as the file extension e.g. testpatt.usr. Pattern files stored on a Windows PC with a *.hpt* or *.bpt* file extension do not need to conform to the 8.3 format.

3.2. Create/Edit File

The Centellax Pattern Utility Software user provides the interface to create custom user patterns for the PPG12500 Programmable Pattern Generator. Figure 3 shows the text window used for entering pattern data.

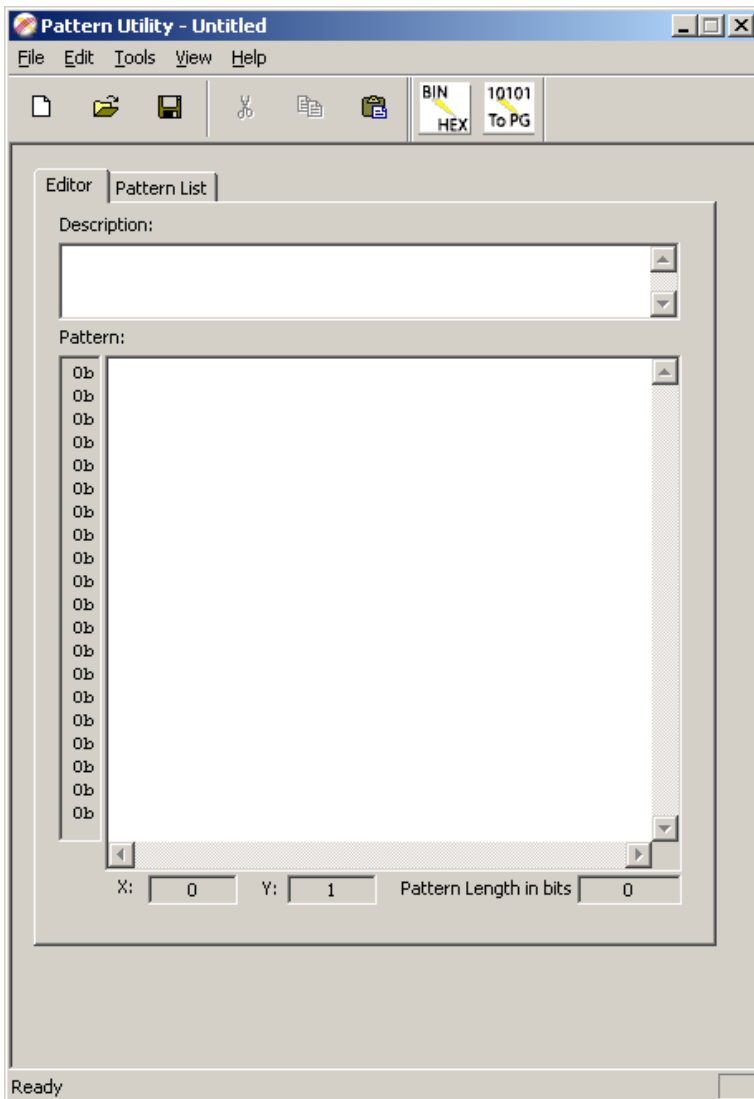


Figure 3 Pattern edit window

When the Centellax Pattern Utility Software is launched, it first scans the host PC's USB interfaces to detect PPG12500 instruments available for connection to the utility. If a PPG12500 is not detected then the window in Figure 4 is displayed. Pressing OK allows the user to continue and create/edit patterns without PPG12500 being connected. These patterns can be stored to the PC for later uploading to a PPG12500.

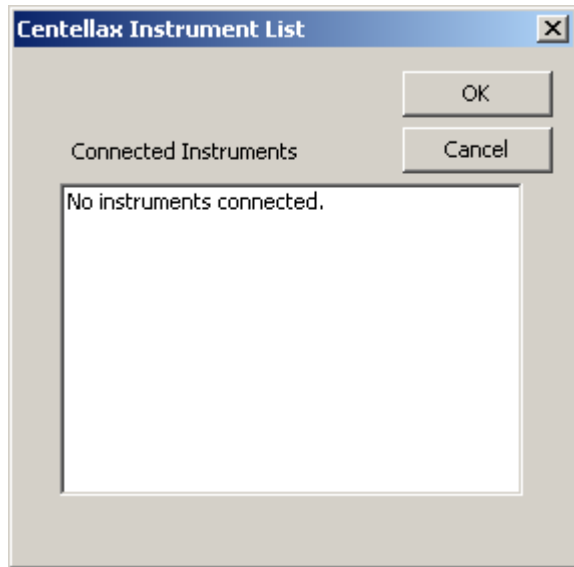


Figure 4 No instruments connected

If one or more PPG12500 instruments are detected then a window similar to Figure 5 is displayed, listing the serial number of each instrument. Select the appropriate PPG12500 from the list available, and click OK to continue.

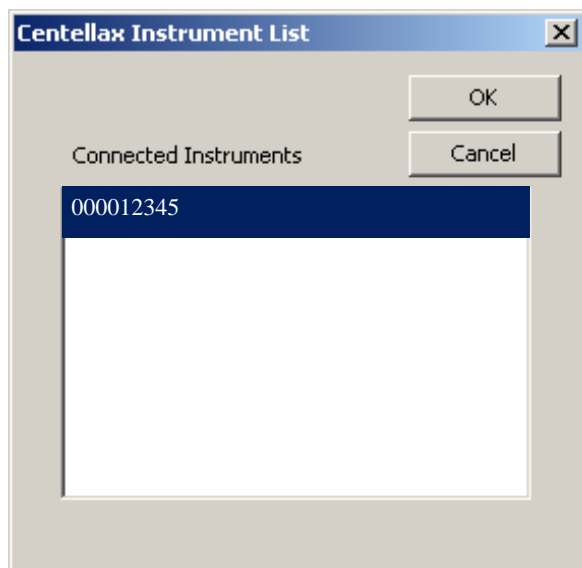


Figure 5 Connected instrument list

The Centellax Pattern Utility Software allows a description of up to 256 characters to be entered in the description window to describe the custom pattern. Comments are not allowed in the pattern edit window. Refer to Figure 6.

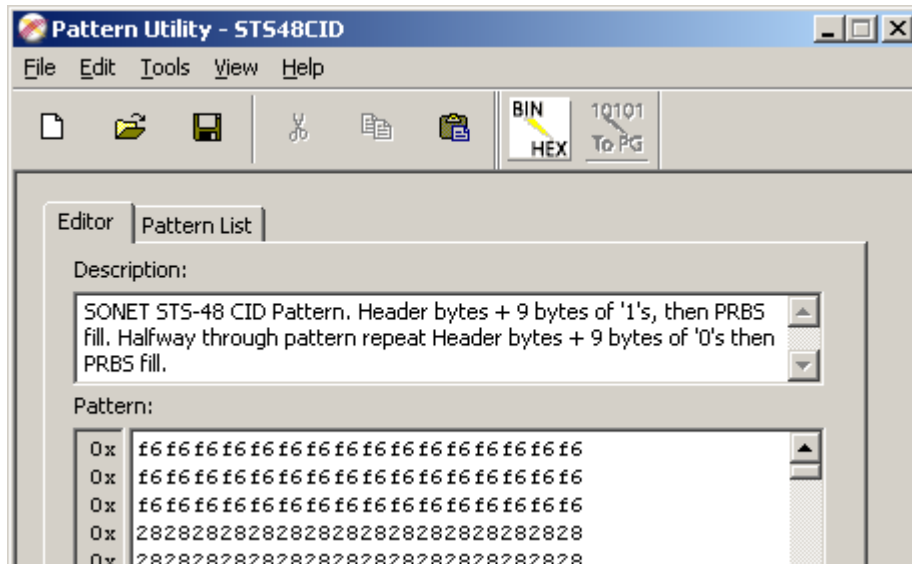



Figure 6 Pattern description field

Each line in the pattern edit window may contain up to 1000 characters. If the Centellax Pattern Utility Software detects more than 1000 characters per line during a file open command or cut and paste operation, the line will be wrapped to the next line in the pattern edit window.

The Centellax Pattern Utility Software allows the numeric base of the pattern data to be toggled between hexadecimal and binary format by clicking on the  icon or selecting '**Tools->Bin/Hex**'. The default numeric base for the pattern data is binary. Clicking once toggles the numeric base from binary to hexadecimal. Clicking once more toggles back from hexadecimal to binary. This action will also reformat the display in the pattern edit window to be a maximum of 32 bits per line in binary mode, and a maximum of 8 characters per line in hexadecimal mode.

If a binary file does not contain a total number of bits that is divisible by 4 then it cannot be displayed in hexadecimal format and an error message will be generated. Refer to Figure 7.



Figure 7 Binary to hexadecimal conversion error

Data can be directly typed into the pattern edit window in either binary or hexadecimal format, or data can be pasted into the window from another application. The total pattern length in bits is displayed at the bottom of the pattern edit window, together with the current x-y position of the cursor. Refer to Figure 8.

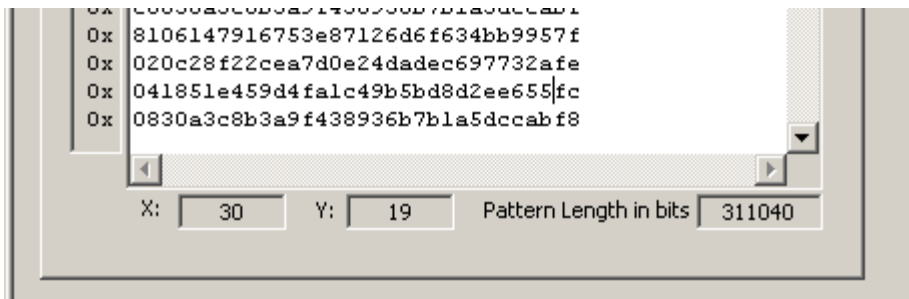



Figure 8 Pattern length display

To clear the current pattern from the editor and start a new pattern, select 'File->New' or click the  icon. A warning message as shown in Figure 9 will be displayed to help prevent accidentally clearing the current pattern. Click Yes to continue or No to cancel the operation.

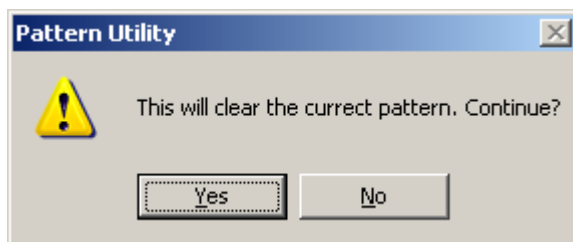



Figure 9 Clear pattern confirmation

3.3. Save Pattern File

The Centellax Pattern Utility Software can save custom user patterns in either binary or hexadecimal file format and will automatically assign a *.bpt* or *.hpt* file extension based on the current pattern mode. To save a file select **'File->Save'** or **'File->Save As'** or click the

 icon and navigate to the desired location. Refer to Figure 10.

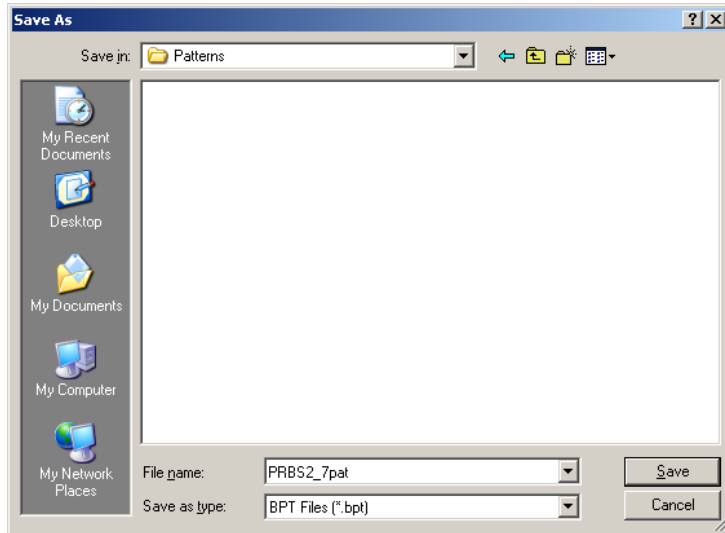



Figure 10 File Save window

3.4. Open Pattern File

The Centellax Pattern Utility Software can open custom user patterns previously created by this utility or also patterns created in an external text editor. To open a file select

'File->Open' or click the  icon. If the current pattern has not been saved then a warning message as shown in Figure 11 will be displayed. Click Yes to save the current pattern first, or No to continue with pattern open command.

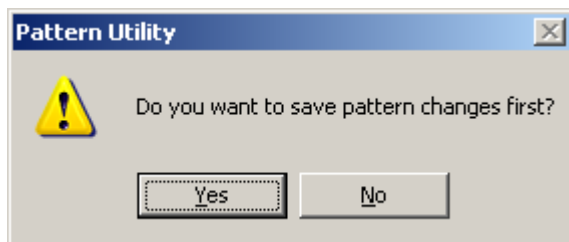



Figure 11 Save pattern warning

The 'File->Open' or clicking on the  icon brings a window similar to that shown in Figure 12. Select "Binary Pattern Files (*.bpt)", "Hexadecimal Patten Files (*.hpt)", or "All Files (*.*)" as appropriate to display just the binary or hexadecimal patterns or all files in the current directory. Select the appropriate pattern to load and click Open.

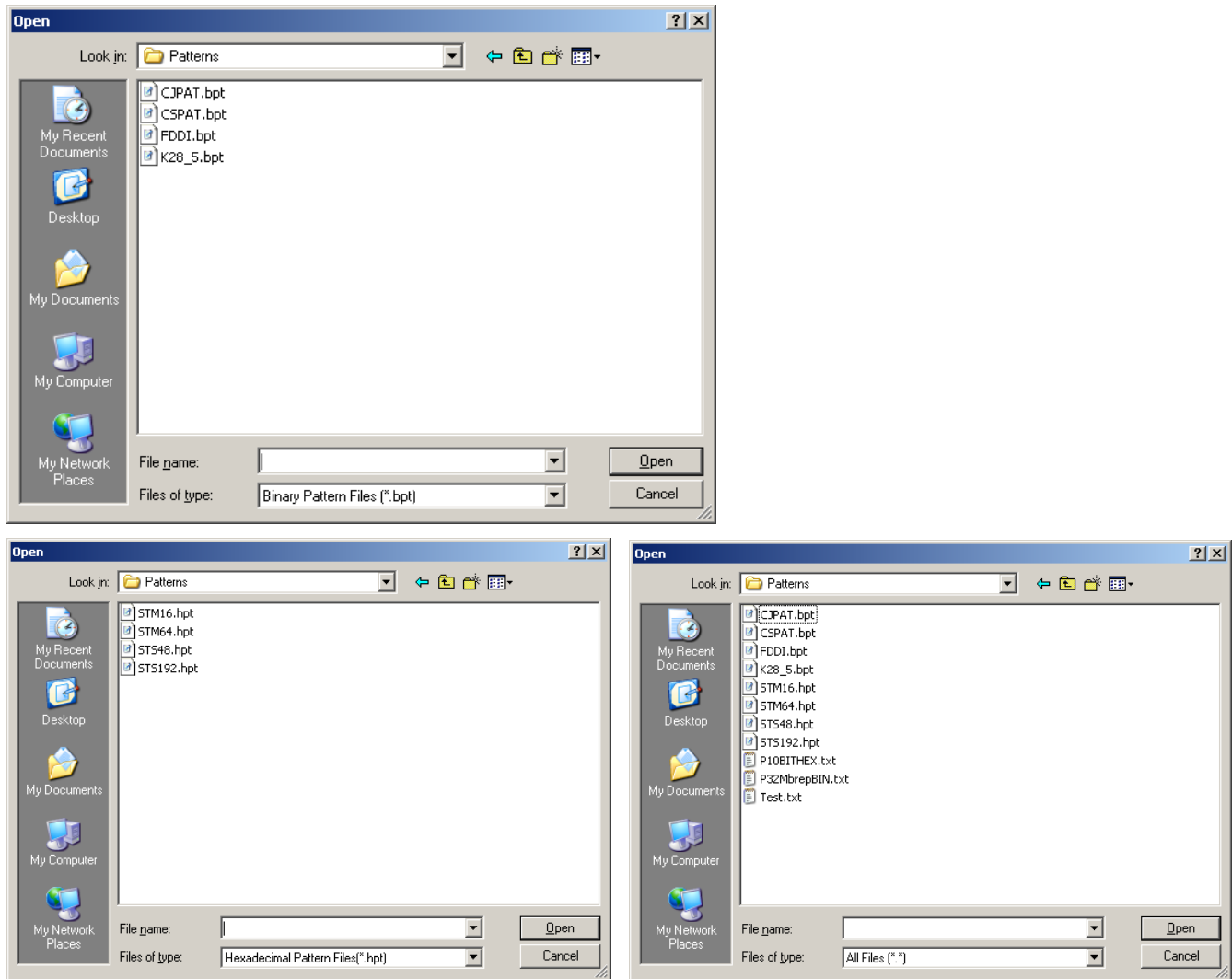


Figure 12 File open windows

A binary pattern file (*.bpt) containing non-binary data will cause an error to occur upon opening. The error message displayed is similar to that shown in Figure 13.

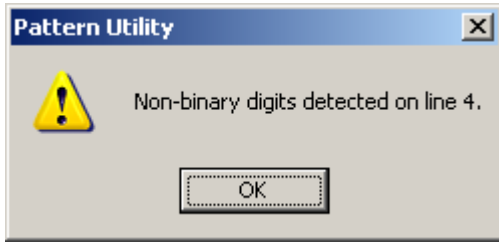


Figure 13 Binary pattern file open error message

A hexadecimal pattern file (*.hpt) containing non-hexadecimal data will cause an error to occur upon opening. The error message displayed is similar to that shown in Figure 14.

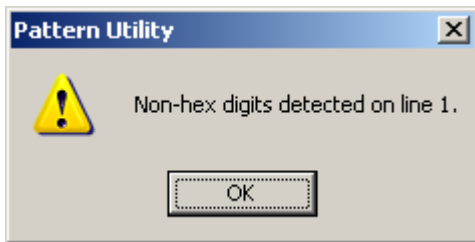



Figure 14 Hexadecimal pattern file open error message

The Centellax Pattern Utility Software will detect the numeric base of the pattern based on the file extension, and select the correct mode, binary or hexadecimal for the editor. If a pattern with a different file extension is loaded (e.g. .txt file) then the current edit mode will be retained.

3.5. Syntax Checking

Pattern structure and syntax must be checked before a pattern is uploaded to the PPG12500. There are several ways to perform a syntax check of the created or imported pattern file.

- 1 A syntax check is performed when a custom user pattern is loaded into the Centellax Pattern Utility Software.
- 2 Select '**Tools->Check Syntax**' to check the syntax of the pattern data in the edit window.
- 3 Selecting '**Tools->Upload Pattern**', or click the  icon. A syntax check is performed before uploading a pattern to the PPG12500.

3.6. Upload Pattern File

Once the pattern data passes the syntax checking it is ready to be uploaded to a PPG12500 Programmable Pattern Generator.


The Centellax Pattern Utility Software scans the host PC's USB interfaces to detect PPG12500 instruments available for connection to the utility. If a PPG12500 is not detected then pattern upload is not possible and the upload icon  and **'Tools->Upload Pattern'** items will be grayed out on the utility window. Refer to Figure 15.



Figure 15 No instruments connected

If the target PPG12500 is connected to the PC via the USB interface but not currently connected to the Centellax Pattern Utility Software, then connect the target PPG12500 by selecting **'Tools->Select Instrument'** and then selecting the PPG12500 from the list of available instruments in the Centellax Instrument List window, by choosing the instrument with the serial number that matches the target PPG12500. Refer to Figure 16.

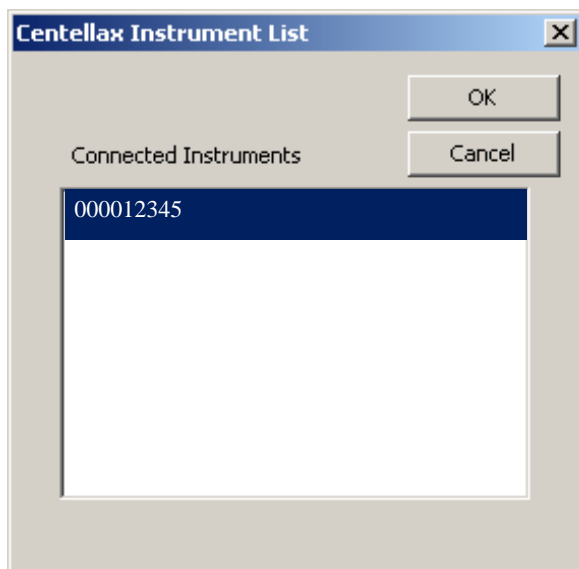



Figure 16 Centellax Instrument List window

Once the target PPG12500 is connected to the Centellax Pattern Utility Software, then select **'Tools->Upload Pattern'** or click the  icon to upload the current pattern to the PPG12500.

The Centellax Pattern Utility Software will first check to see if there is sufficient space on the target PPG12500 for the user pattern. If there is insufficient space an error message will be displayed and the upload cancelled.

If the current pattern has not been saved to the PC hard disk, the user will be prompted to save the file first before uploading to the PPG12500. Refer to Figure 17.

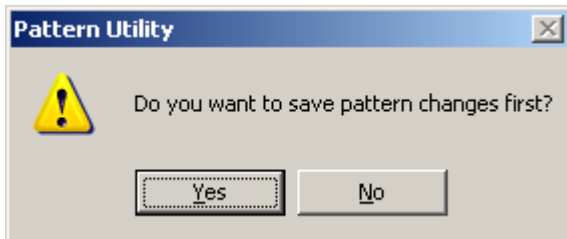


Figure 17 Pattern save warning

If the current pattern file has a filename longer than 8 characters, a dialog similar to Figure 18 will be displayed. The PPG12500 requires filenames in a DOS 8.3 format, e.g. TESTPATT.USR. The 3 character file extension need not be entered as all user patterns uploaded to the PPG12500 are assigned .usr file extension. Only characters in the following sets are allowed in the PPG12500 filename:

- a-z
- A-Z
- 0-9
- Underscore ‘_’ and minus ‘-’ symbols

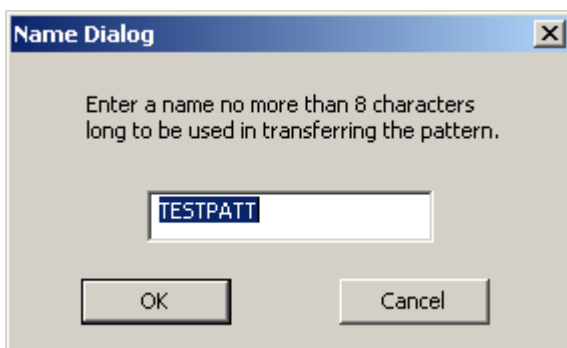


Figure 18 Pattern name dialog window

During the pattern upload, a progress bar will be displayed to track the time until completion. If the pattern file is uploaded successfully, a message will be displayed. Refer to Figure 19. Most patterns will load within a short time, however a pattern utilizing the entire 32Mbit memory can take approx 30minutes to transfer to the PPG12500.

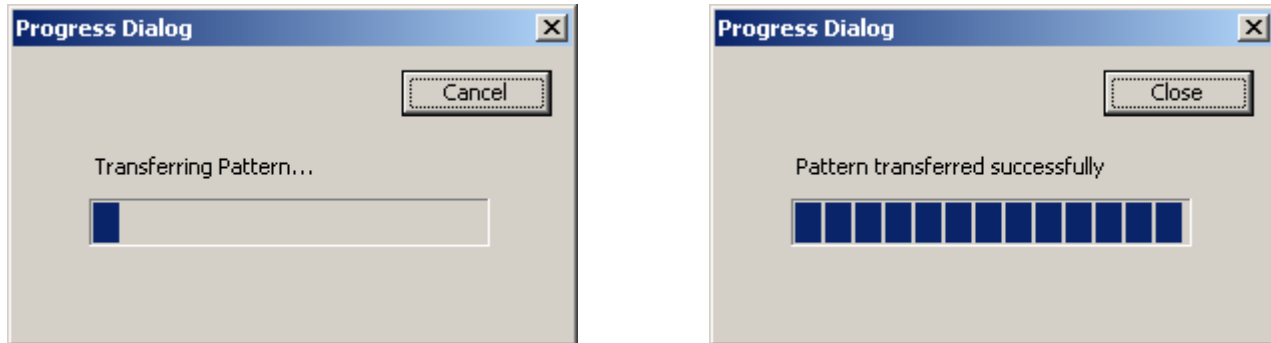


Figure 19 Pattern upload in progress window

Once a pattern has been successfully uploaded to the PPG12500, use the Pattern Select menu on the PPG12500 to select the uploaded pattern as the active pattern on the PPG12500.

3.7. Exit Application

To exit the Centellax Pattern Utility Software application select '**File->Exit**'. If the current pattern has not been saved to the PC hard disk, the user will be prompted to save the file first before exiting the Centellax Pattern Utility Software application. Refer to Figure 20.

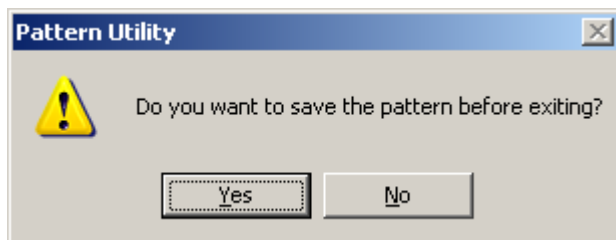


Figure 20 Pattern save warning on exit

4. Managing Patterns – the Pattern List Window

4.1. Pattern List

When the target PPG12500 is selected from the Centellax Instrument List, then a list of all the patterns available on the target PPG12500 is displayed on the Pattern List window. Refer to Figure 21.

Patterns in this list with a *.fpt* file extension (e.g. PN7_4-8.FPT) are factory loaded RAM patterns within the PPG12500. These patterns are listed for information purposes only.

Patterns in this list with a *.usr* file extension (e.g. 1_90.USR) are user patterns that have been loaded into the PPG12500 using the Centellax Pattern Utility Software.

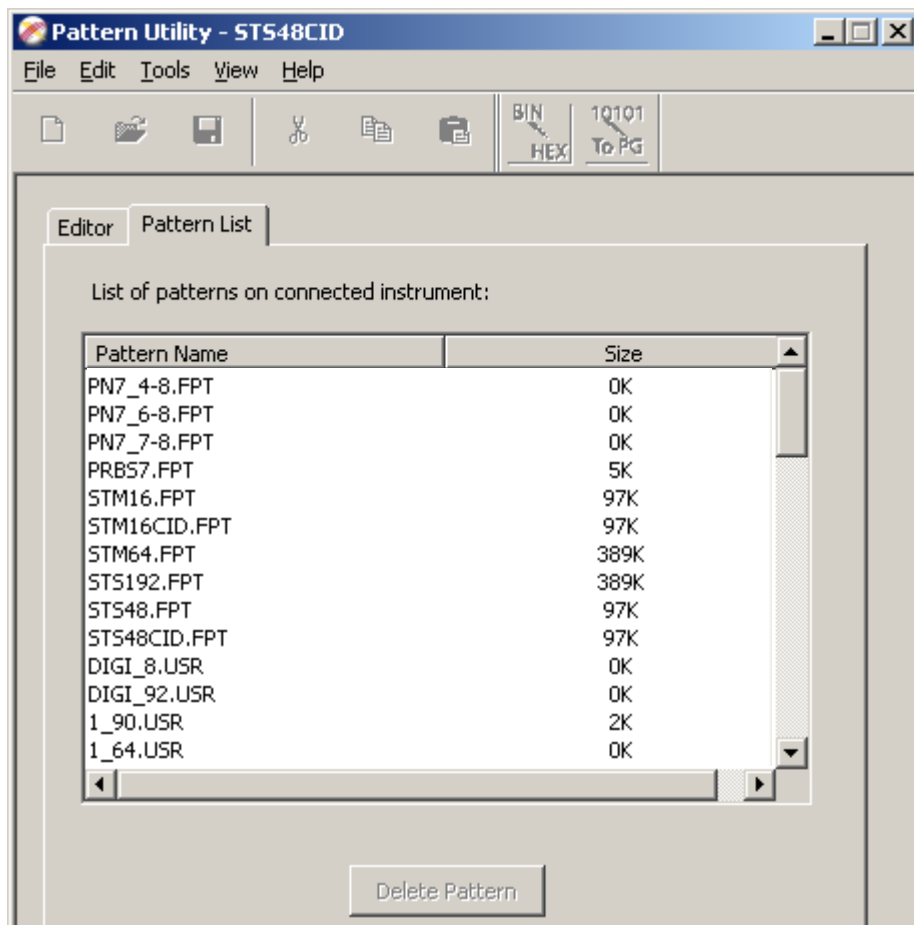



Figure 21 Pattern list window

4.2. Delete Pattern

Only *.usr* user patterns can be deleted from the target PPG12500. To delete a user pattern, select it from the list and click on the  button.

A confirmation message as shown in Figure 22 will be displayed. Click Yes to continue with the pattern delete or click No to cancel the operation.

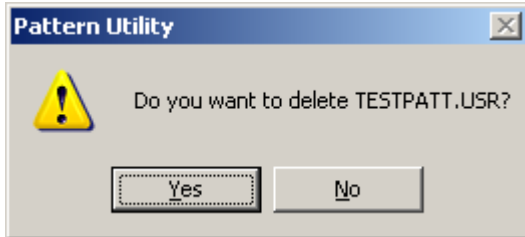


Figure 22 Delete pattern confirmation

Attempts to delete factory patterns will generate an error message as shown in Figure 23.

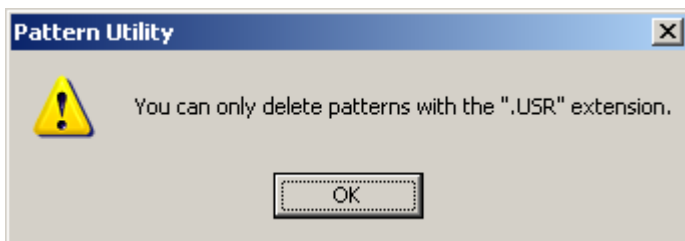


Figure 23 Pattern delete error message